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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/682,589	10/09/2003	Mohamed Arafa	1000-0020	9777

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EXAMINER	
CHAN, RICHARD	

ART UNIT	PAPER NUMBER
2685	

DATE MAILED: 02/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/682,589	ARAFA, MOHAMED	
	Examiner	Art Unit	
	Richard Chan	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/09/2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,10-14,16-18,20-23 and 25-28* is/are rejected.

7)☒ Claim(s) *9,15,19,24,29 and 30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/14/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-6 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Denis (US 2003/0100272 A1).

With respect to claim 1, Denis discloses the antenna diversity receiver comprising: a first filter 31; a second filter 32; a low noise amplifier (LNA) 2; and an output switch 34 having a first switch position to couple an output of said first filter 31 to an input of said LNA and a second switch position to couple an output of said second filter 32 to said input of said LNA 2.

With respect to claim 2, Denis discloses the receiver of claim 1, wherein: said first filter 31 has a first bandpass frequency range paragraph 28, said second filter 32 has a second bandpass frequency range that is different from said first bandpass frequency range, and said LNA is operable within both said first and said second bandpass frequency ranges. [0028]

With respect to claim 3, Denis discloses the receiver of claim 1, further comprising: an antenna terminal connected between antenna 1 and switch 33; and a selector switch 33 having a first switch position to couple said antenna terminal 1 to an input of said first filter 31 and a second switch position to couple said antenna terminal to an input of said second filter 32.

With respect to claim 4, Denis discloses the receiver of claim 3, further comprising: a receive antenna 1 connected to said antenna terminal.

With respect to claim 5, Denis discloses the receiver of claim 3, wherein: said selector switch 33, said first 31 and second filters 32, and said output switch 34 are located within a common module such as the self adapting filtering device 3 and wherein the LNA 2 is implemented on a separate semiconductor chip that is coupled to said module 3.

With respect to claim 6, Denis discloses the receiver of claim 3, wherein: said selector switch 33, said first 31 and second filters 32, said output switch 34, and said LNA 2 are implemented on a common semiconductor chip.

With respect to claim 18, Denis discloses the module for use within an antenna diversity receiver system, comprising: a first antenna terminal; a first plurality of filters 31 and 32,

said first plurality of filters including at least a first filter 31 and a second filter 32; a first selector switch to controllably couple said first antenna terminal to an input of a selected one of the filters in said first plurality of filters; an output terminal for connection to an external low noise amplifier (LNA); and an output switch having a first switch position to couple an output of said first filter to said output terminal and a second switch position to couple an output of said second filter to said output terminal.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denis (US 2003/0100272 A1) in view of Thompsen (US 6,584,304).

With respect to claim 7, Denis discloses the receiver of claim 3, however does not disclose a third filter that is different from said first and second filters, wherein said selector switch includes a third switch position to couple said antenna terminal to an input of said third filter.

However the Thomsen reference discloses a third filter 23' that is different from said first and second filters, wherein said selector switch 10 includes a third switch 12' position to couple said antenna terminal 1 to an input of said third filter 23'.

It would have been obvious to one of ordinary skill in the art to implement a third filter with the receiver of Denis in order to be able to accommodate more bands in the system.

With respect to claim 8, Denis and Thompsen combined disclose the receiver of claim 7, however does not disclose wherein: said output switch has a third switch position to couple an output of said third filter to an input of said LNA.

It would have been obvious to one of ordinary skill in the art to implement a third position in the output switch in order to accommodate the addition of a third signal from the third filter 23' as disclosed by Thompsen.

3. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denis (US 2003/0100272) in view of Ellaet (US 6,751,470).

With respect to claim 10, Denis discloses the receiver of claim 1, however does not disclose wherein: said first filter includes a surface acoustic wave (SAW) filter.

The Ellaet reference however disclose wherein a SAW filter is implemented in a multiband system in Col.2 lines 3-9

It would have been obvious to one of ordinary skill in the art to implement a SAW filter as the filter type of the receiver of Ellaet to the multiband receiver of Denis in order to achieve the appropriate bandnotch frequency.

With respect to claim 11, Denis discloses the receiver of claim 1, however does not disclose wherein: said first filter includes a film bulk acoustic resonator (FBAR) filter.

The Ellaet reference however disclose wherein a film bulk acoustic resonator (FBAR) filter is implemented in a multiband system in Col.7 paragraph 1

It would have been obvious to one of ordinary skill in the art to implement a film bulk acoustic resonator (FBAR) filter as the filter type of the receiver of Ellaet to the multiband receiver of Denis in order to achieve the appropriate bandnotch frequency.

4. Claims 12-14,16,17,20-23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denis in view of Nadgauda(US 6,901,122).

With respect to claim 12, Denis discloses the receiver of claim 1, wherein: however does not disclose wherein said receiver is a dual antenna diversity receiver. The Nadgauda reference however discloses a dual antenna diversity receiver in Fig.1.

It would have been obvious to one of ordinary skill in the art to implement a diversity receiver system such as the receiver disclosed by Nadgauda with the multiband receiver disclosed by Denis in order to have a primary and secondary channel for detecting cellular bands

With respect to claim 13, Denis discloses a receiver comprising: a first antenna terminal 1; a first plurality of filters 31 and 32; a first selector switch 33 to controllably couple said first antenna terminal to an input of a selected one of the filters in said first plurality of filters; at least one first low noise amplifier 2 (LNA); at least one first output

switch 34 to controllably couple an output of said selected one of said filters in said first plurality of filters to an input of a corresponding first LNA; however Denis does not disclose wherein a second antenna terminal; a second plurality of filters; a second selector switch to controllably couple said second antenna terminal to an input of a selected one of the filters in said second plurality of filters; at least one second LNA; and at least one second output switch to controllably couple an output of said selected one of said filters in said second plurality of filters to an input of a corresponding second LNA.

The Nadgauda reference discloses a diversity receiver in which there are two branches working in parallel with each other to receiver signals from transmitters. It would have been obvious to one of ordinary skill in the art to implement the multiband receiver of Denis into the diversity receiver environment as disclosed by Nadgauda in order to obtain multiple channels of reception of the transmitted signals.

With respect to claim 14, Denis and Nadgauda combined disclose the receiver of claim 13, Denis and Nadgauda combined continues to disclose wherein: said first plurality of filters and said second plurality of filters include an equal number of filters

It would have been obvious to one of ordinary skill in the art to implement the Denis receiver as the receiver branch of Nadgauda in order to implement a multiband receiver as diversity system.

With respect to claim 16, Denis and Nadgauda combined disclose the receiver of

claim 13, wherein: said first 106 and second 108 antenna terminals, and wherein the receiver disclosed by Denis would be the branch receiver as disclosed by Nadgauda 102 and 104 said first and second pluralities of filters, said first and second selector switches, said at least one first output switch, said at least one second output switch, said at least one first LNA, and said at least one second LNA are located on a common semiconductor chip on device 3 in Denis.

The Nadgauda reference discloses a diversity receiver in which there are two branches working in parallel with each other to receiver signals from transmitters. It would have been obvious to one of ordinary skill in the art to implement the multiband receiver of Denis into the diversity receiver environment as disclosed by Nadgauda in order to obtain multiple channels of reception of the transmitted signals.

With respect to claim 17, Denis and Nadgauda combined disclose the receiver of claim 13, Nadgauda continues to disclose the receiver further comprising: at least one other antenna terminal 108.

It would have been obvious to one of ordinary skill in the art to implement another antenna in order to create a diversity receiver environment.

With respect to claim 20, Denis discloses the module of claim 18, however Denis does not disclose wherein the module furthers comprises a second antenna terminal; a second plurality of filters; and a second selector switch to controllably couple said second antenna terminal to an input of a selected one of the filters in said second plurality of filters.

The Nadgauda reference however discloses wherein a second antenna 108 and second branch receiver 104 is implemented as a diversity receiver.

It would have been obvious to implement the multiband receiver as disclosed by Denis as the receiver branch 104 disclosed by Nadgauda in order to obtain a diversity multiband receiver.

With respect to claim 21, Denis and Nadgauda combined disclose the module of claim 20, however Nadgauda further discloses wherein: said module is for use within a dual antenna diversity receiver system100.

With respect to claim 22, Denis discloses a system comprising: a first antenna terminal 1 coupled to said first patch antenna1; a first plurality of filters 31 and 32; a first selector switch 33 to controllably couple said first antenna terminal 1 to an input of a selected one of the filters in said first plurality of filters; at least one first low noise amplifier (LNA) 2; at least one first output switch 34 to controllably couple an output of said selected one of said filters in said first plurality of filters to an input of a corresponding first LNA 2; however Denis does not disclose a second antenna terminal coupled to said second patch antenna; a second plurality of filters; a second selector switch to controllably couple said second antenna terminal to an input of a selected one of the filters in said second plurality of filters; at least one second LNA; and at least one second output switch to controllably couple an output of said selected one of said filters in said second plurality of filters to an input of a corresponding second LNA.

However the Nadgauda reference discloses a diversity receiver environment wherein there are two antennas 100 and 108 wherein each antenna has a branch receiver.

The Nadgauda reference discloses a diversity receiver in which there are two branches working in parallel with each other to receiver signals from transmitters. It would have been obvious to one of ordinary skill in the art to implement the multiband receiver of Denis into the diversity receiver environment as disclosed by Nadgauda in order to obtain multiple channels of reception of the transmitted signals.

With respect to claim 23, Denis and Nadgauda combined disclose the system of claim 22, Denis continues to disclose wherein: said at least one first LNA 2 includes a single LNA 2 and said at least one first output switch 34 includes a single output switch 34.

With respect to claim 25, Denis and Nadgauda combined disclose the system of claim 22, however Nagauda continues to disclose wherein: said system is a handheld communicator.

5. Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nadgauda (US 6,901,122) in view of Denis (US 2003/0100272).

With respect to claim 26, Nadgauda discloses the method for use in an antenna diversity receiver 100 however does not specifically disclose the specific operation wherein within a first frequency band is desired: coupling a first antenna to an input of a first filter; and coupling an output of said first filter to an input of a first low noise amplifier (LNA); and when operation within a second frequency band is desired: coupling said first antenna to an input of a second filter; and coupling an output of said second filter to said input of said first LNA.

The Denis reference however discloses the specific receiver structure wherein a first frequency band is desired: coupling a first antenna 1 to an input of a first filter 31; and coupling an output of said first filter 31 to an input of a first low noise amplifier 2 (LNA); and when operation within a second frequency band is desired: coupling said first antenna 1 to an input of a second filter 32; and coupling an output of said second filter 32 to said input of said first LNA 2.

It would have been obvious to implement the receiver as disclosed by Denis as the branch receiver of Nadgauda in order to implement a amultiband receiver in a diversity receiver system.

With respect to claim 27, Nadgauda and Denis combined disclose the method of claim 26, Nadgauda and Denis combined continues to disclose the receiver further comprising: when operation within said first frequency band is desired: coupling a second antenna 108 the receiver disclosed by Denis.

It would have been obvious to implement the receiver as disclosed by Denis as the branch receiver of Nadgauda in order to implement a amultiband receiver in a diversity receiver system.

With respect to claim 28, Nadgauda and Denis combined disclose the method of claim 26, Denis continues to disclose wherein: coupling an output of said first filter 31 to an input of a first LNA 2 includes sending a control signal 84 to a switch 34.

Allowable Subject Matter

Claims 9,19,24,29, and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 9 discloses a second LNA and second output switch, said second output switch having a first switch position to couple an output of said of said third filter to an input switch of said second LNA. The prior art discloses an input and output switch, first LNA, and two filters, however does not disclose wherein a third filter is connected to the input of a second amplifier.

Claim 15 discloses wherein a second output switch is located within a common module and said at least one first LNA and said at least one second LNA are located on a separate semiconductor chip that is coupled to said module. The prior art discloses a first output switch connected to a LNA, however does not disclose wherein second LNA

located on a separate semiconductor chip is coupled to said module with first and second switch.

Claim 19 discloses a second output terminal for connection to a second external LNA; and a second output switch having a first switch position to couple an output of said third filter to said second output terminal and a second switch position to couple an output of said fourth filter to said second output terminal. The prior art discloses an input and output switch, first LNA, and two filters, however does not disclose wherein a second output switch position to couple an output of said third and fourth filter and is connected to the input of a second amplifier.

Claim 24 discloses at least one first LNA including two LNA and one first output switch including two output switches. The prior discloses a first LNA including only one first LNA and an output switch including only one switch.

Claim 29 discloses a operation within a third frequency wherein the coupling of said first antenna to an input of a fifth filter, and coupling of fifth filter to an input of said first LNA. The prior discloses the coupling of a first antenna to only up to three filters, and does not discloses wherein a fifth filter connected to an input of a third LNA.

Claim 29 discloses wberein an operation within a third frequency band is desired, coupling said first antenna to an input of a fifth filter, and coupling an output of said fifth filter to an input of a third LNA. The prior discloses wherein a operation within a third frequency band is desired, a first antenna is coupled to a third filter connected to a third LNA.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Robinett reference (US 2005/0227631) discloses a multi-antenna transceiver system.

The Ella reference (US 2005/0085260) discloses a front end arrangements for multiband for multiband multimode communication engines.

The Agahi-Kesheh reference (US 6,466,768) discloses a multiband filter system for wireless communication receiver.

The hey-Shipton reference (US 2004/0092243) discloses a MEMS-based bypass system for use with a HTS RF receiver.

The Webster reference (US 2003/0104797) discloses a soft decision gain compensation for receiver filter attenuation.

The Abdelmonem reference (US 2002/0173341) discloses a method and apparatus for increasing sensitivity in a communication system base station.

The Ella reference (US 2005/0245201) discloses a front end topology for multiband multimode communication engines.

The Persico reference (US 2006/0009177) discloses a low power wireless diversity receiver with multiple receive paths.

The Sugar reference (US 6,728,517) discloses a multiple input multiple output radio transceiver.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Chan whose telephone number is (571) 272-0570. The examiner can normally be reached on Mon - Fri (9AM - 5PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on (571) 272-7882. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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02/14/06

2/21/06